IN THE CLAIMS

Please cancel claims 22 and 32, and amend claims 21 and 31 as follows:

1. (Original) A method for carrying out an idle handoff from a macrocell to a microcell (picocell) in a hierarchical cell structure, comprising the steps of:

a) providing different frequency assignments (FA) to the macrocell and the microcell in a same service band, to construct the hierarchical cell structure;

b) transmitting cell structure information of neighboring base stations and a pseudo noise (PN) code from a base station to a mobile station;

c) checking whether the mobile station for receiving a service through the macrocell is in the hierarchical cell by using the cell structure information of the neighboring base station; and

d) checking whether a value of the pseudo noise (PN) code is greater than T_ADD and greater than Ec/Io of the macrocell, by periodically searching the pseudo noise (PN) code of the microcell, to carry out the idle handoff to the microcell, wherein the T_ADD represents a value of a base station pilot strength required for the base station of a neighboring set to be included in a candidate set, the Ec represents pilot energy accumulated during one pseudo noise (PN) chip period, and the Io indicates a total power spectrum density within a reception bandwidth of the macrocell.

2. (Original) The method as recited in claim 1, further comprising the step of e) allocating in cross, frequency of the macrocell and the microcell (picocell) to a primary channel and a secondary channel of a number assignment module (NAM) of a single mode mobile station.

3. (Original) The method as recited in claim 1, wherein the cell structure information of the neighboring base station is transmitted, being contained into an

51876.P237   2

overhead message of a paging channel.

4. (Original) The method as recited in claim 1, wherein the cell structure information of the neighboring base station is transmitted by using a preliminary field or an additional field of a neighbor list message.

5. (Original) A method for carrying out an idle handoff from a microcell (picocell) to a macrocell in a hierarchical cell structure, comprising the steps of:

a) providing different frequency assignments (FA) to the macrocell and the microcell(picocell) in a same service band, to construct the hierarchical cell structure;

b) transmitting cell structure information of neighboring base stations and a pseudo noise (PN) code from a base station to a mobile station;

c) checking whether the mobile station for receiving a service through the microcell (picocell) thereof is in the hierarchical cell, by using the cell structure information of the neighboring base station;

d) deciding a time point of searching for a signal of the macrocell according to a pilot signal strength of a microcell signal; and

e) checking whether a value of the pseudo noise (PN) code is greater than T_ADD and greater than Ec/Io of the macrocell by periodically searching the pseudo noise (PN) code of the macrocell, to carry out the idle handoff to the macrocell, wherein the T_ADD represents a value of a base station pilot strength required for the base station of a neighboring set to be included in a candidate set, the Ec represents pilot energy accumulated during one pseudo noise (PN) chip period, and the Io indicates a total power spectrum density within a reception bandwidth of the macrocell.

6. (Original) The method as recited in claim 5, further comprising the step of f) allocating in cross, frequency of the macrocell and the microcell (picocell) to a primary channel and a secondary channel of a number assignment module (NAM) of a single mode

51876.P237   3

mobile station.

7. (Original) The method as recited in claim 5, wherein in said step d), the signal of the macrocell is searched for the sake of the handoff when a received power level of a microcell signal is less than a received level threshold Rx_T which indicates a time point for preparing the handoff and when the Ec/Io of the microcell signal is less than a pilot signal strength threshold T_Threshold which represents the time point of searching the signal of the handoff.

8. (Original) The method as recited in claim 5, wherein the cell structure information of the neighboring base station is transmitted, being contained into an overhead message of a paging channel.

9. (Original) The method as recited in claim 5, wherein the cell structure information of the neighboring base station is transmitted by using a preliminary field or an additional field of a neighbor list message.

10. (Original) A method for carrying out a handoff in traffic from a macrocell to a microcell (picocell) in a hierarchical cell structure, comprising the steps of:

a) providing different frequency assignments (FA) to the macrocell and the microcell (picocell) in a same service band, to construct the hierarchical cell structure;

b) transmitting cell structure information of neighboring base stations and a pseudo noise (PN) code from a base station to a mobile station;

c) checking whether the mobile station in traffic in the macrocell is in the hierarchical cell, by using the cell structure information of the neighboring base station; and

d) checking whether a value of the pseudo noise (PN) code is greater than T_ADD by periodically searching the pseudo noise (PN) code of the microcell, to carry out the

51876.P237   4

handoff in traffic to the microcell.

11. (Original) The method as recited in claim 10, further comprising the step of e) allocating in cross, frequency of the macrocell and the microcell (picocell) to a primary channel and a secondary channel of a number assignment module (NAM) of a single mode mobile station.

12. (Original) The method as recited in claim 10, wherein said step d) comprises the steps of:

d1) transmitting by the mobile station a pilot strength measurement message (PSMM) to the base station of the macrocell through a reverse traffic channel;

d2) transmitting information to the base station of a corresponding microcell (picocell) to prepare the handoff, according that the base station of the macrocell recognizes that the mobile station enters the microcell (picocell), through the received pilot strength measurement message (PSMM);

d3) transmitting, by the base station of the microcell (picocell), a frequency assignment(FA) number and a traffic channel number etc. to be used by the mobile station, to the base station of the macrocell, and transmitting a null traffic to the mobile station;

d4) transmitting, by the base station of the macrocell, information required for the handoff, to the mobile station through a handoff direction message (HDM); and

d5) performing the handoff in traffic from the mobile station to which the handoff direction message (HDM) was received, to the base station of the microcell(picocell), and transmitting a handoff completion message (HCM) to the base station of the microcell (picocell).

13. (Original) The method as recited in claim 10, wherein the cell structure information of the neighboring base station is transmitted, being contained into a neighbor list update message of a traffic channel.

51876.P237   5

14. (Original) The method as recited in claim 10, wherein the cell structure information of the neighboring base station is transmitted by using a preliminary field or an additional field of the neighbor list update message.

15. (Original) A method for carrying out a handoff in traffic from a microcell (picocell) to a macrocell in a hierarchical cell structure, comprising the steps of:

a) providing different frequency assignments (FA) to the macrocell and the microcell (picocell) in a same service band, to construct the hierarchical cell structure;

b) transmitting cell structure information of neighboring base stations and a pseudo noise (PN) code, from a base station to a mobile station;

c) checking whether the mobile station for receiving a service through the microcell (picocell) thereof is in the hierarchical cell, by using the cell structure information of the neighboring base station;

d) deciding a time point of searching for a signal of the macrocell according to a pilot signal strength of a microcell signal; and

e) checking whether a value of the pseudo noise (PN) code is greater than T_ADD, by periodically searching the pseudo noise (PN) code of the macrocell, to carry out the handoff in traffic to the macrocell.

16. (Original) The method as recited in claim 15, further comprising the step of f) allocating in cross, frequency of the macrocell and the microcell(picocell) to a primary channel and a secondary channel of a number assignment module (NAM) of a single mode mobile station.

17. (Original) The method as recited in claim 15, wherein said step e) includes the steps of:

e1) transmitting by the mobile station a pilot strength measurement message

51876.P237   6

(PSMM) to the base station of the microcell (picocell) through a reverse traffic channel;

e2) transmitting information to the base station of a corresponding macrocell to prepare the handoff, according that the base station of the microcell recognizes that the mobile station enters the macrocell, through the pilot strength measurement message (PSMM);

e3) transmitting, by the base station of the macrocell, a frequency assignment(FA) number and a traffic channel number etc. to be used by the mobile station, to the base station of the microcell, and transmitting a null traffic to the mobile station;

e4) transmitting, by the base station of the microcell, information required for the handoff, to the mobile station through a handoff direction message (HDM); and

e5) performing the handoff in traffic from the mobile station to which the handoff direction message (HDM) was received, to the base station of the macrocell, and transmitting a handoff completion message (HCM) to the base station of the macrocell.

18. (Original) The method as recited in claim 15, wherein in said step d), the signal of the microcell is searched for the sake of the handoff when a received power level of the microcell signal is less than a received power level threshold Rx_T which indicates a time point of searching for a signal of the handoff and when the Ec/Io of the microcell signal is less than a pilot signal strength threshold T_Threshold which represents the time point of searching the signal of the handoff.

19. (Original) The method as recited in claim 15, wherein the cell structure information of the neighboring base stations is transmitted, being contained into a neighbor list update message.

20. (Original) The method as recited in claim 15, wherein the cell structure information of the neighboring base station is transmitted by using a preliminary field or an additional field of the neighbor list update message.

51876.P237   7

21.   (Currently Amended) A method for carrying out a handoff between an upper cell and a lower cell in a hierarchical cell structure, comprising the steps of:

a) providing different frequency assignments (FA) to the upper cell and the lower cell in a same service band, to construct a hierarchical cell; and

b) confirming the hierarchical cell according to cell structure information of neighboring base stations, searching for a PN code of a cell where a mobile station is moved to, and performing the handoff; and

c) allocating in cross, frequency of the upper cell and the lower cell to a primary channel and a secondary channel of a number assignment module (NAM) of a single mode mobile station.

22.   (Cancelled)

23.   (Original) A computer readable medium storing instructions for executing a method for carrying out an idle handoff from a macrocell to a microcell (picocell) in a hierarchical cell structure in a radio communication system having a microprocessor, the method comprising the steps of:

a) providing different frequency assignments (FA) to the macrocell and the microcell (picocell) in a same service band, to construct a hierarchical cell;

b) transmitting cell structure information of neighboring base stations and a pseudo noise (PN) code, from a base station to a mobile station;

c) checking whether the mobile station for receiving a service through the macrocell is in the hierarchical cell, by using the cell structure information of the neighboring base station; and

d) checking whether a value of the pseudo noise (PN) code is greater than

8

T_ADD and greater than Ec/Io of the macrocell, by periodically searching the pseudo noise (PN) code of the microcell, to carry out the idle handoff to the microcell.

24.   (Original) The computer readable medium as recited in claim 23, wherein the computer has the record of the program to further realize a fifth function of allocating in cross, frequency of the macrocell and the microcell (picocell) to a primary channel and a secondary channel of a number assignment module (NAM) of a single mode mobile station.

25.   (Original) A computer readable medium storing instructions for executing a method for carrying out an idle handoff from a microcell (picocell) to a macrocell in a hierarchical cell structure in a radio communication system having a microprocessor, the method comprising the steps of:

a) providing different frequency assignments (FA) to the macrocell and the microcell (picocell) in a same service band, to construct a hierarchical cell;

b) transmitting cell structure information of neighboring base stations and a pseudo noise (PN) code, from a base station to a mobile station;

c) checking whether the mobile station for receiving a service through the microcell(picocell) is in the hierarchical cell, by using the cell structure information of the neighboring base station;

d) deciding a time point to find out a signal of the macrocell according to a pilot signal strength of a microcell signal; and

e) checking whether a value of the pseudo noise (PN) code is greater than T_ADD and greater than Ec/Io of the microcell, by searching the pseudo noise (PN)

9

code of the macrocell, to carry out the idle handoff to the macrocell.

26.   (Original) The computer readable medium as recited in claim 25, wherein the computer has the record of the program to further realize a sixth function of allocating in cross, frequency of the macrocell and the microcell(picocell) to a primary channel and a secondary channel of a number assignment module (NAM) of a single mode mobile station.

27.   (Original) A computer readable medium storing instructions for executing a method for carrying out a handoff in traffic from a macrocell to a microcell (picocell) in a hierarchical cell structure in a radio communication system having a microprocessor, the method comprising the steps of:

a) providing different frequency assignments (FA) to the macrocell and the microcell (picocell) in a same service band, to construct a hierarchical cell;

b) transmitting cell structure information of neighboring base stations and a pseudo noise (PN) code, from a base station to a mobile station;

c) checking whether the mobile station communicating with the macrocell is in the hierarchical cell, by using the received cell structure information of the neighboring base station; and

d) checking whether a value of the pseudo noise (PN) code is greater than T_ADD, by periodically searching the pseudo noise (PN) code of the microcell, to carry out the handoff in traffic to the microcell.

28.   (Original) The computer readable medium as recited in claim 27,

10

wherein the computer has the record of the program to further realize a fifth function
of allocating in cross, frequency of the macrocell and the microcell(picocell) to a
primary channel and a secondary channel of a number assignment module (NAM) of a
single mode mobile station.

29.   (Original) A computer readable medium storing instructions for
executing a method for carrying out a handoff in traffic from a microcell (picocell) to
a macrocell in a hierarchical cell structure in a radio communication system having a
microprocessor, the method comprising the steps of:

a) providing different frequency assignments (FA) to the macrocell and the
microcell (picocell) in a same service band, to construct a hierarchical cell;

b) transmitting cell structure information of neighboring base stations and a
pseudo noise (PN) code, from a base station to a mobile station;

c) checking whether the mobile station for receiving a service through the
microcell (picocell) is in the hierarchical cell, by using the received cell structure
information of the neighboring base station;

d) deciding a time point to find out a signal of the macrocell according to a
pilot signal strength of a microcell signal; and

e) checking whether a value of the pseudo noise (PN) code is greater than
T_ADD, by periodically searching the pseudo noise (PN) code of the macrocell, to
carry out the handoff in traffic to the macrocell.

30.   (Original) The computer readable medium as recited in claim 29,

wherein the computer has the record of the program to further realize a sixth function

of allocating in cross, frequency of the macrocell and the microcell(picocell) to a

primary channel and a secondary channel of a number assignment module (NAM) of a

single mode mobile station.

31.   (Currently Amended) A computer readable medium storing

instructions for executing a method for carrying out a handoff between an upper cell

and a lower cell in a hierarchical cell structure in a radio communication system

having a microprocessor, the method comprising the steps of:

a) providing different frequency assignments (FA) to the upper cell and the

lower cell in a same service band, to construct a hierarchical cell; and

b) clarifying the hierarchical cell according to cell structure information of

neighboring base stations, searching for a PN code of a cell where a mobile station is

moved to, and performing the handoff.

Wherein the computer has the record of the program to further realize a third

function of allocating in cross, frequency of the upper cell and the lower cell to a

primary channel and a secondary channel of a number assignment module (NAMJ) of

a single mode mobile station.

32. (Cancelled)

12